### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

: 23.09.98 Edition : ISO 4113 Test oil

Combination No. : 0 402 796 039

Injection pump

Pump designation : PES6H110/320RS21 EP type number : 0 412 716 005

Governor

Governer design. : RE36

Governer no. : 0 421 890 373

Cust. part No. : 51.11103-7529

Customer-spec. information

Customer : MAN

: D0826 LF13/LFL09 Motor

Power KW : 191.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.0

Test oil inlet

40 temp. °C : <del>←</del> 2.0 Tolerance °C

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : +- 0.1

Test nozzle holde

: 1 688 901 103 assembly

Opening pressure

208.5 Tolerance bar : ← 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter: 2.0 600 x length mm :

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 8.00Tolerance mm :  $\leftarrow 0.05$ Check

tolerance mm :  $\leftarrow$  0.10

Rack travel in mm: 10.50 Tolerance mm : ← 0.50

Firing order : 1-5- 3- 6- 2-: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : **←** 0.50

Check

tolerance °NW : +- 0.75

## Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : + 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR **POSITION** 

Engine speed min-1:

Setting point (P, R and H pump)

Uact V : 3.100 CRT mm : 13.00 3.100 Tolerance mm : +/-0.05

Check

tolerance mm : +/- 0.10

Check value (P, R and H pump)

Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check

tolerance mm :  $\pm -0.30$ 

Setting point (digital M)

: 3.100 : 12.50 Uact V CRT mm Tolerance mm :  $\pm -0.05$ Check

tolerance mm :  $\pm -0.10$ 

Check value (M pump)

: 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25

Check

tolerance mm :  $\pm -0.30$ 

Stop position (P, R and H pump)

: Value with Uact V

deenergised adjusting magnet

and control rod in stop position.

CRT mm : 0.75 : +/- 0.25 Tolerance mm

Check

: +/- 0.35 tolerance mm

Stop position

(M pump)

Uact V 0,720 :

Tolerance Volt : +- 0,065 CRT mm : 1,00

Starting position

(amua M)

Uact V 4,500 Tolerance Volt : +- 0,115 : 19,00 CRT mm Tolerance mm : +- 0,80

ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20

Engine speed min-1: 600

Difference

Amplitude to

Amplitude V : max.1.4

(C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

Rated speed rpm : 850 Uact V 2.490

Prestroke solenoid

Stroke mm : 11.10 Del. quantity

cm3/1000 strokes : 224.0 Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0

Check tolerance

cm3/1000s. : <del>+-</del> 4.0 FUEL DELIVERY CHARACTERISTICS

Rated speed rpm : 1150 Uact V 2.440

Prestroke solenoid

9.30 Stroke mm

Del. quantity

cm3/1000 strokes : 206.0

Tolerance

cm3/1000 strokes : +- 6.0

Check tolerance

cm3/1000S. : **←** 10.0

Rated speed rpm Uact V	:		500 1.750
Prestroke solenoi Stroke mm Del. quantity	id :		9.80
cm3/1000 strokes Tolerance	:		1 <b>3</b> 5.0
cm3/1000 strokes Check tolerance	:	+-	5.0
cm3/1000\$.	:	+-	9.0

Rated speed rpm	:		700
Prestroke solenoi	ď		
Stroke mm	:		9.30
Del. quantity			
cm3/1000 strokes	:		70.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000\$.	:	+-	8.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000S.	:		8.0

Rated speed rpm Uact V	:		300 1.310
Tolerance Volt	:	+-	0.060
Check tolerance			0.080
Volt Prestroke solenoi	ત	-	0.000
Stroke mm	<b>.</b>		11.10
Del. quantity	•		
cm3/1000 strokes	:		26.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance cm3/1000 strokes			7.0
Check tolerance	•		7.0
cm3/1000s.	:		11.0

# STARTING FUEL DELIVERY

Rated speed rpm Uact V	:	100 2.050
Prestroke solenoi Stroke mm Del. quantity	id :	5.50
cm3/1000 strokes Tolerance	:	130.0
cm3/1000 strokes	; 4	<del>-</del> 8.0

Check tolerance				
cm3/1000s.	:	+-	12.0	

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 23.09.98 : ISO 4113

Combination No. : 0 402 795 203

Injection pump

Pump designation : PES5H120/720/3LS1010

EP type number : 0 412 725 206

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No. : 51.11103-7476

Customer-spec. information

Customer : MAN

Motor

: D 2865 LF 09

Power KW

: 250.0

### TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C

40

Tolerance °C

: +- 2.0

Overflow valve : 2 417 413 073

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

208.5

Tolerance bar

: **←** 1.5

Test Lines : 1 680 750 089

Outside diameter :

8.0

x inside diameter : x length mm :

### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

#### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance par : +- 1.0

Prestroke mm : 10.00 Tolerance mm : <del>+-</del> 0.05

Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50 : **←** 0.50 Tolerance mm

Firing order : 1-3-5-4-2

: 0-72-144-216-288 Phasing

Tolerance : **←** 0.50

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance

: +- 0.50

Check

tolerance °NW : +- 0.75

Barrel no.

: 5

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) 13.00 3.100 Uact V CRT mm : +/- 0.05 Tolerance mm Check : +/- 0.10 tolerance mm Check value (P, R and H pump) 1.700 Uact V CRT mm 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/-0.30Setting point (M pump) Uact V 3.100 CRT mm 12.50 Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm Check value (M pump) 1.700 Uact V 5.50 CRT mm : +/- 0.25 Tolerance mm Check : +/- 0.30 tolerance mm Stop position (P, R and H pump) : Value with Uact V deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm : +/- 0.25 Tolerance mm Check tolerance mm : +/- 0.35Stop position (M pump) 0,720 Uact V Tolerance Volt : + 0,065

CRT mm : 1,00 Starting position (dmuq M) 4,500 Uact V Tolerance Volt : +- 0,115 CRT mm 19,00 Tolerance mm : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 750 Uact V 3.350 Prestroke solenoid Stroke mm Del. quantity cm3/1000 strokes : 326.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000s. : +-FUEL DELIVERY CHARACTERISTICS 1000 Rated speed rpm Uact V 3.290 Prestroke solenoid 8.00 Stroke mm Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes :  $\leftarrow$  4.0 Check tolerance cm3/1000s. : <del>←</del> 8.0

Rated speed rpm :

500

A05

Uact V	:		2.100
Prestroke solenoid Stroke mm	:		6.20
Del. quantity cm3/1000 strokes	:		167.0
Tolerance cm3/1000 strokes	:	+-	4.0
Check tolerance cm3/1000s.	:	+-	8.0

Rated speed rpm	:		700
Prestroke solennid			
Stroke mm	:		10.00
Del. quantity			
cm3/1000 strokes	:		70.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000\$.	:	+	8.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000s.	:		9.0

Rated speed rpm	:		300
Uact V	:		1.500
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.080
Prestroke solenoi	d		
Stroke mm	:		7.20
Del. quantity			
cm3/1000 strokes	:		25.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			
cm3/1000S.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	174.0
Tolerance		
cm3/1000 strokes	: +-	- 10.0

Check tolerance			
cm3/1000S.	:	+-	14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

: 23.09.98 Edition Test oil : ISO 4113

Combination No. : 0 402 795 204

Injection pump

Pump designation : PES5H120/720/3LS1011

EP type number : 0 412 725 207

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No. : 51.11103-7538

Customer—spec. information

Customer : MAN

Motor : D 2865 LF 09 Power KW : 250.0

### TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

40 temp. °C Tolerance °C : <del>+-</del> 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

: 1 688 901 105 assembly

Opening pressure

208.5 bar Tolerance bar : +- 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0 600 x length mm :

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting.

Setting of constant delivery under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00Tolerance mm :  $\leftarrow 0.05$ 

Check

tolerance mm :  $\leftarrow$  0.10

Rack travel in mm : 10.50 Tolerance mm : +- 0.50

Firing order : 1-3-5-4-2

: 0-72-144-216-288 : +- 0.50 Phasing

Tolerance

Check

tolerance °NW : <del>+-</del> 0.75

## Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 5

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR	+
POSITION	+ Starting position
	(M pump)  - Uact V : 4,500  - Tolerance Volt : +- 0,115
Engine speed min-1: 0	+ Uact V : 4,500
	+ Tolerance Volt : +- 0,115
Setting point	+ CRT mm : 19,00
(P, R and H pump)	+ Tolerance mm : +- 0,80
	+
Uact V : 3.100	+
Uact V : 3.100 CRT mm : 13.00	+ ENGINE-SPEED SENSOR
Tolerance mm : +/- 0.05	+ (All P and R pumps not
Check	+ Hand M pumps)
tolerance mm : +/- 0.10	+
	+ Test with control rod
Check value	in stop position
(P, R and H pump)	1
We will be to party	+ Engine speed min-1: 60
	+ Amplitude V : 1.4
Uact V : 1.700	Amplitude V : 1.4 Tolerance V : +/- 0.6
CRT mm : 6.15	+ Check
Tolerance mm : +/- 0.25	+ tolerance V : +/- 1.20
Check	
tolerance mm : +/- 0.30	Engine speed min-1: 600
toter ance min	+ Difference
	+ Amplitude to
Setting point	+ Amplitude V : max.1.4
Setting point	T Ampercude v . max.1.4
(M pump)	Ţ
11 V	T
Uact V : 3.100 CRT mm : 12.50	(C) INJECTION PUMP WITH POSITIONER
CRT mm : 12.50 Tolerance mm : +/- 0.05	(C) INDECITOR FORD WITH POSTITONER
	TECT DOTAGE UI
Check	TEST POINT V1
tolerance mm : +/- 0.10	750
	+ Rated speed rpm : 750
Check value	+ Uact V : 3.350
(M. pump)	+ Prestroke solenoid
4 =	Stroke mm : 10.00
Uact V : 1.700	+ Del. quantity
CRT mm : 5.50	+ cm3/1000 strokes : 326.0
Talananaa mm . ±/= // 25	
Tolerance mm : +/- 0.25	+ Tolerance
Check	+ cm3/1000 strokes : ← 1.0
	cm3/1000 strokes : + 1.0 Check tolerance
Check tolerance mm : +/- 0.30	+ cm3/1000 strokes : ← 1.0 + Check tolerance + cm3/1000s. : ← 4.0
Check tolerance mm : +/- 0.30  Stop position	cm3/1000 strokes : + 1.0 Check tolerance
Check tolerance mm : +/- 0.30	+ cm3/1000 strokes : ← 1.0 + Check tolerance + cm3/1000s. : ← 4.0
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet	cm3/1000 strokes : \( + \) 1.0 Check tolerance cm3/1000s. : \( + \) 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290
Check tolerance mm : +/~ 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in	cm3/1000 strokes : \( + \) 1.0 Check tolerance cm3/1000s. : \( + \) 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid
Check tolerance mm : +/~ 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	cm3/1000 strokes : ← 1.0 Check tolerance cm3/1000s. : ← 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check	cm3/1000 strokes : \( + \) 1.0 Check tolerance cm3/1000s. : \( + \) 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	cm3/1000 strokes : ← 1.0 Check tolerance cm3/1000s. : ← 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0 Check tolerance
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check	cm3/1000 strokes : ← 1.0 Check tolerance cm3/1000s. : ← 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75  Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0 Check tolerance
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0 Check tolerance
Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position (M pump)	cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s. : + 4.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 1000 Uact V : 3.290 Prestroke solenoid Stroke mm : 8.00 Del. quantity cm3/1000 strokes : 306.0 Tolerance cm3/1000 strokes : + 4.0 Check tolerance

Uact V	:		2.100	
Prestroke solenoio Stroke mm	<b>a</b> :		6.20	
Del. quantity cm3/1000 strokes	:		167.0	
Tolerance cm3/1000 strokes		+-	4.0	
Check tolerance	•			
cm3/1000\$.	:	+-	8.0	
Rated speed rpm	:		700	
Prestroke solenoid Stroke mm	t:		10.00	
Del. quantity	·			
cm3/1000 strokes Tolerance	:		70.0	
cm3/1000 strokes Check tolerance	:	+-	4.0	
cm3/1000s.	:	+-	8.0	
Spreed Tolerance				
cm3/1000 strokes Check tolerance	:		5.0	
cm3/1000s.	:		9.0	
TEST POINT L1				
Rated speed rpm	:		300	
Uact V Tolerance Volt	:	+-	1.500 0.060	
Check tolerance Volt		+	0.080	
Prestroke solenoid		·		
Stroke mm Del. quantity	:		7.20	
cm3/1000 strokes Tolerance	:		25.0	
cm3/1000 strokes	:	+-	3.0	
Spreed Tolerance				
cm3/1000 strokes Check tolerance	:		8.0	
cm3/1000s.	:		12.0	
				_
STARTING FUEL DELI	:VI	ERY		
Rated speed rpm	:		100 2.450	
Uact V Prestroke solenoid				
Stroke mm Del. quantity	:		7.00	
cm3/1000 strokes	:		174.0	
Tolerance cm3/1000 strokes	:	+-	10.0	

Check tolerance			
cm3/1000S.	:	+-	14.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition

: 23.09.98

Test oil

: ISO 4113

Combination No. : 0 402 795 205

Injection pump

Pump designation: PES5H120/720/3LS1013

EP type number : 0 412 725 209

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7540

Customer-spec. information

Customer : MAN

Motor

: D 2865 LUH 07

Power KW

: 228.0

### TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

temp. °C

40

Tolerance °C

: +- 2.0

Overflow valve : 2 417 413 082

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

208.5

Tolerance bar

: **←** 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

A10

x inside diameter: 3.0

x length mm : 600

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 10.00 Tolerance mm : +- 0.05 : +- 0.05 Tolerance mm Check

tolerance mm : +- 0.10

Rack travel in mm: 10.50 Tolerance mm :  $\leftarrow$  0.50

Firing order : 1-3-5-4-2

: 0-72-144-216-288 Phasing

: +- 0.50 Tolerance

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : **←** 0.75

Barrel no. : 5

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION Starting position (M pump) Engine speed min-1: Uact V 4,500 : +- 0,115 Tolerance Volt 19,00 Setting point CRT mm : +- 0,80 (P, R and H pump) Tolerance mm Uact V CRT mm : 3.100 : 13.90 3.100 ENGINE-SPEED SENSOR Tolerance mm : +/- 0.05 (All P and R pumps not H and M pumps) Check : +/- 0.10 tolerance mm Test with control rod in stop position Check value (P, R and H pump) Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/-0.61.700 Uact V CRT mm 6.15 Check Tolerance mm : +/- 0.25 tolerance V : +/- 1.20 Check tolerance mm :  $\pm -0.30$ Engine speed min-1: 600 Difference Amplitude to Setting point Amplitude V : max.1.4 (dmuq M) : 3... 12.50 Uact V 3.100 (C) INJECTION PUMP WITH POSITIONER CRT mm : +/- 0.05 Tolerance mm TEST POINT V1 Check tolerance mm : +/- 0.10 Rated speed rpm : 750 3.350 Uact V Check value Prestroke solenoid (M pump) Stroke mm 10.00 : 1.700 Del. quantity Uact V 5.50 cm3/1000 strokes : 332.0 CRT mm : +/- 0.25 Tolerance Tolerance mm cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance mm : +/- 0.30 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS Stop position (P, R and H pump) Rated speed rpm : 1000 : Value with deenergised adjusting magnet Uact V 3.290 and control rod in Prestroke solenoid stop position. Stroke mm 8.00 CRT mm 0.75 Del. quantity : +/- 0.25 cm3/1000 strokes : 312.0 Tolerance mm Tolerance Check tolerance mm :  $\pm -0.35$ cm3/1000 strokes :  $\leftarrow$  4.0 Check tolerance Stop position cm3/1000s.: +- 8.0 (M pump) 0,720 Uact V Tolerance Volt :  $\leftarrow$  0,065 Rated speed rpm : 500

CRT mm : 1,00

A11

Uact V	: 2.100
Prestroke solenoi	id
Stroke mm Del. quantity	: 6.20
cm3/1000 strokes	: 173.0
Tolerance	· +- 4 N
cm3/1000 strokes Check tolerance	: +- 4.0
cm3/1000s.	: ← 8.0
Rated speed rpm	: 700
Prestroke solenoi	
Stroke mm Del. quantity	: 10.00
cm3/1000 strokes	: 70.0
Tolerance	
cm3/1000 strokes Check tolerance	: +- 4.0
cm3/1000S.	: <del></del> 8.0
Spreed	
Tolerance cm3/1000 strokes	: 5.0
Check tolerance	. 2.3
cm3/1000s.	: 9.0
TEST POINT L1	
Rated speed rpm	: 300
Uact V	: 1.500
Tolerance Volt	: <b>←</b> 0.060
Check tolerance Volt	: <b>←</b> 0.080
Prestroke solenoi	
Stroke mm	: 7.20
Del. quantity cm3/1000 strokes	: 32.0
Tolerance	. 52.0
cm3/1000 strokes	: <b>←</b> 3.0
Spreed Tolerance	
	: 8.0
Check tolerance	. 13.0
cm3/1000s.	: 12.0
OTABTING SUSTA	THEOL
STARTING FUEL DEL	TAFKA
Rated speed rpm	: 100
Uact V	: 2.450
Prestroke solenoic Stroke mm	a: 7.00
Del. quantity	
cm3/1000 strokes	: 185.0
Tolerance cm3/1000 strokes	: +- 10 0
CIIIJ/ 1000 311 0NB3	. / 10.0

Check tolerance cm3/1000s. : +- 14.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 23.09.98 Test oil : ISO 4113

Combination No. : 0 402 796 040

Injection pump

Pump designation : PES6H12O/32ORS22 EP type number : 0 412 726 011

Governor

Governer design. : RE36

Governer no. : 0 421 890 373

Cust. part No. : 51.11103-7537

Customer-spec. information

Customer : MAN

Motor : D 0826 LUH 12

Power KW : 162.0

### TEST BENCH REQUIREMENTS

Inlet line : 3.0

Test oil inlet

temp. °C : 40Tolerance °C : +- 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0 x length mm : 600

#### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVER

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 8.00
Tolerance mm : + 0.05
Check
tolerance mm : + 0.10

Rack travel in mm : 10.50

Tolerance mm : + 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance :  $\leftarrow$  0.50

Check

tolerance  $^{\circ}NW$  :  $\leftarrow$  0.75

Start of delivery blocking

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION	Starting position
Engine speed min-1: 0	Uact V : 4,500
Setting point	(M pump)  + Uact V : 4,500  + Tolerance Volt : + 0,115  - CRT mm : 19,00  + Tolerance mm : + 0,80
(P, R and H pump)	toterance min . +- 0,00
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	+ ENGINE-SPEED SENSOR + (All P and R pumps not + H and M pumps)
Check value	Test with control rod in stop position
(P, R and H pump)	+ Engine speed min-1: 60
4 700	Amplitude V : 1.4 Tolerance V : +/- 0.6
Uact V : 1.700 CRT mm : 6.15	+ Check
Tolerance mm : +/- 0.25	tolerance V : +/- 1.20
Check tolerance mm : +/- 0.30	Engine speed min-1: 600 Difference
Setting point (M pump)	Amplitude to Amplitude V : max.1.4
	<del> </del>
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05	(C) INJECTION PUMP WITH POSITIONER
Check	TEST POINT V1
tolerance mm : +/- 0.10	+ + Rated speed rpm : 800
Check value (M pump)	- Uact V : 2.510 - Prestroke solenoid
Uact V : 1.700	+ Stroke mm : 13.20 + Del. quantity
CRT mm : 5.50	- cm3/1000 strokes : 222.0
Tolerance mm : +/- 0.25 Check	+ Tolerance + cm3/1000 strokes : +- 1.0
tolerance mm : +/- 0.30	+ Check tolerance
Stop position	+ cm3/1000S. : +- 4.0 + FUEL DELIVERY CHARACTERISTICS
(P, R and H pump)	<u> </u>
Uact V : Value with	Rated speed rpm : 1200
deenergised adjusting magnet and control rod in	+ Uact V : 2.540 + Prestroke solenoid
stop position.	+ Stroke mm : 10.30
CRT mm : 0.75	+ Del. quantity
Tolerance mm · +/- 0 25	+ cm3/1000 strokes · 209 0
Tolerance mm : +/- 0.25 Check	- cm3/1000 strokes : 209.0 - Tolerance
Check	Tolerance cm3/1000 strokes : +- 6.0

Uact V : 1.930 Prestroke solenoid Stroke mm : 10.40
Prestroke solenoid
Stroke mm : 10.40
6 - 1
Del. quantity cm3/1000 strokes : 146.0
Tolerance
cm3/1000 strokes : + 4.0
Check tolerance cm3/1000s. : +- 8.0
Rated speed rpm : 700
Rated speed rpm : 700 Prestroke solenoid
Stroke mm : 10.30
Del. quantity
cm3/1000 strokes : 70.0 Tolerance
cm3/1000 strokes : +- 4.0
Check tolerance
cm3/1000S. : +- 8.0 Spreed
Spreed Tolerance
cm3/1000 strokes : 5.0
Check tolerance
cm3/1000S. : 9.0
TEST POINT L1
Rated speed rpm : 300
Rated speed rpm : 300 Uact V : 1.440
Tolerance Volt : + 0.060
Tolerance Volt : + 0.060 Check tolerance
Tolerance Volt : $\leftarrow 0.060$ Check tolerance Volt : $\leftarrow 0.080$
Tolerance Volt : +- 0.060 Check tolerance
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : ← 3.0 Spreed Tolerance
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0
Tolerance Volt : ← 0.060 Check tolerance Volt : ← 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : ← 3.0 Spreed Tolerance
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY Rated speed rpm : 100
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY  Rated speed rpm : 100 Uact V : 2.100
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY Rated speed rpm : 100
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY  Rated speed rpm : 100 Uact V : 2.100 Prestroke solenoid Stroke mm : 7.20 Del. quantity
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY  Rated speed rpm : 100 Uact V : 2.100 Prestroke solenoid Stroke mm : 7.20 Del. quantity cm3/1000 strokes : 104.0
Tolerance Volt : + 0.060 Check tolerance Volt : + 0.080 Prestroke solenoid Stroke mm : 8.80 Del. quantity cm3/1000 strokes : 17.0 Tolerance cm3/1000 strokes : + 3.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. : 12.0  STARTING FUEL DELIVERY  Rated speed rpm : 100 Uact V : 2.100 Prestroke solenoid Stroke mm : 7.20 Del. quantity

Check tolerance			
cm3/1000s.	:	+-	10.0
<del></del>			<del></del>

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 23.09.98 Test oil : ISO 4113

Combination No. : 0 402 796 202

Injection pump

Pump designation : PES6H12O/72O/3LS1017

EP type number : 0 412 726 213

Governor

Governer design. : RE33

Governer no. : 0 421 890 371

Cust. part No. : 51.11103-7477

Customer-spec. information

Customer : MAN
Motor : D 2866 LF 16
Power KW : 294.0

## TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C

: 40

Tolerance °C : +- 2.0

Overflow valve : 2 417 413 073

Inlet press. bar :

3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

: 208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0 x length mm : 600

### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00 Tolerance mm : +- 0.05 Check tolerance mm : **←** 0.10

Rack travel in mm : 10.50 Tolerance mm : +- 0.50

Firing order : 6-2-4-1-5-

: 0-60-120-180-240 Phasing

: -300

Tolerance : +- 0.50

Check

tolerance °NW : +- 0.75

Start of delivery blocking

Tolerance : +- 0.50

Check

tolerance °NW : ← 0.75

Barrel no. : 6

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) : Uact V CRT mm 3.100 13.00 : +/- 0.05 Tolerance mm Check tolerance mm : +/- 0.10 Check value (P, R and H pump) : 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/-0.25Check tolerance mm :  $\pm -0.30$ Setting point (dmuq M) : 3.100 : 12.50 Uact V CRT mm Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm Check value (amua M) : 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Stop position (P, R and H pump) Uact V : Value with deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm : +/- 0.25 Tolerance mm Check tolerance mm :  $\pm - 0.35$ Stop position (dmuq M)

: 0,720

Tolerance Volt : ← 0,065 CRT mm 1,00 Starting position (qmuq M) Uact V 4,500 Tolerance Volt : ← 0,115 CRT mm : 19,00 Tolerance mm :  $\leftarrow$  0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 750 Uact V 3.350 Prestroke solenoid Stroke mm 10.00 Del. quantity cm3/1000 strokes : 328.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 1000 Uact V 3.290 Prestroke solenoid 8.00 Stroke mm : Del. quantity cm3/1000 strokes : 308.0 Tolerance cm3/1000 strokes :  $\leftarrow$  4.0 Check tolerance : +- 8.0 cm3/1000s.

Uact V

00
20
. 0
.0
.0

Rated speed rpm	:		700
Prestroke solenoi Stroke mm	a :		10.00
Del. quantity			70.0
cm3/1000 strokes	:		70.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000s.	:	+-	8.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000S.	:		9.0

Rated speed rpm Uact V	:		<b>3</b> 00 1.500
Tolerance Volt	:	+-	0.060
Check tolerance Volt		+-	0.080
Prestroke solenoid	ď		0.000
Stroke mm	:		7.20
Del. quantity cm3/1000 strokes			25.0
Tolerance	•		25.0
cm3/1000 strokes	:	+-	3.0
Spreed Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			42.0
cm3/1000S.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	177.0
Tolerance		
cm3/1000 strokes	: +	- 10.0

Check tolerance			
cm3/1000S.	:	+-	14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 23.09.98 : ISO 4113

Combination No. : 0 402 796 203

Injection pump

Pump designation : PES6H120/720/3LS1016

EP type number : 0 412 726 212

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7479

Customer-spec. information

Customer : MAN

Motor : D 2866 LUH 21 Power KW : 257.0

## TEST BENCH REQUIREMENTS

Inlet line : 4(EHAB)

Test oil inlet

temp. °C : 40 Tolerance °C :  $\leftarrow$  2.0

Overflow valve : 2 417 413 073

Inlet press. bar : 3.0 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

x inside diameter : 3.0 x length mm : 600

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar : 26.0

Tolerance bar : +- 1.0

Check

tolerance mm : **←** 0.10

Rack travel in mm: 10.50

Tolerance mm : +- 0.50

Firing order : 6-2-4-1-5-

Phasing

: 0-60-120-180-240

Tolerance

: -300

Check

: <del>←</del> 0.50

tolerance °NW : + 0.75

Start of delivery blocking

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : + 0.75

Barrel no. : 6

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR **POSITION** 

Engine speed min-1:

Setting point (P, R and H pump)

: 3.100 : 13.00 3.100 Uact V CRT mm : +/- 0.05 Tolerance mm

Check

tolerance mm : +/- 0.10

Check value (P, R and H pump)

Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check

tolerance mm : +/-0.30

Setting point (M pump)

: 3.100 : 12.50 Uact V CRT mm : +/- 0.05 Tolerance mm Check

: +/- 0.10 tolerance mm

Check value (qmuq M)

: 1.700 : 5.50 Uact V CRT mm Tolerance mm : +/- 0.25

Check

tolerance mm : +/- 0.30

Stop position (P, R and H pump)

: Value with Uact V

deenergised adjusting magnet

and control rod in

stop position.

CRT mm 0.75 Tolerance mm : +/- 0.25

Check

: +/- 0.35tolerance mm

Stop position (M pump)

Uact V 0,720 :

Tolerance Volt : +- 0,065 : 1,00 CRT mm

Starting position

(M pump)

4,500 Uact V Tolerance Volt : +- 0,115 19,00 CRT mm Tolerance mm : +- 0,80

ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6

Check

tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

## (C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

750 Rated speed rpm : Uact V 3.350

Prestroke solenoid

Stroke mm : 10.00 Del. quantity

cm3/1000 strokes : 332.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0

Check tolerance

cm3/1000s. : +- 4.0 FUEL DELIVERY CHARACTERISTICS

Rated speed rpm : 1000 Uact V 3.290

Prestroke solenoid

Stroke mm 8.00 Del. quantity

cm3/1000 strokes : 312.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  4.0

Check tolerance

cm3/1000s. : +- 8.0

A20

Rated speed rpm	:		500
Uact V	:		2.100
Prestroke solenoid			
Stroke mm	:		6.20
Del. quantity			
cm3/1000 strokes	:		173.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000\$.	:	+-	8.0

Rated speed rpm Prestroke solenoid			700
Stroke mm	<b>a</b> :		10.00
Del. quantity cm3/1000 strokes			70.0
Tolerance	:		70.0
cm3/1000 strokes	:	<del>!-</del>	4.0
Check tolerance cm3/1000s.	:	+-	8.0
Spreed			
Tolerance cm3/1000 strokes	:		5.0
Check tolerance cm3/1000s.	:		9.0

Rated speed rpm Uact V Tolerance Volt	:	+-	300 1.500 0.060
Check tolerance Volt Prestroke solenoi	: d	+-	0.080
Stroke mm Del. quantity	-:		7.20
cm3/1000 strokes	:		33.0
Tolerance cm3/1000 strokes Spreed	:	+-	3.0
Tolerance cm3/1000 strokes Check tolerance	:		8.0
cm3/1000s.	:		12.0

## STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	185.0
Tolerance		
cm3/1000 strokes	: +	- 10.0

Check tolerance	
cm3/1000S. : +- 14.	0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

: 22.09.98 Edition Test oil : ISO 4113

Combination No. : 0 402 796 205

Injection pump

Pump designation : PES6H12O/72O/3LS1015

EP type number : 0 412 726 211

Governor

Governer design. : RE33

Governer no. : 0 421 890 372

Cust. part No. : 51.11103-7541

Customer-spec. information

Customer : MAN

: D 2866 LUH 21 Motor

: 257.0 Power KW

## TEST BENCH REQUIREMENTS

Inlet line : 4.1

Test oil inlet

temp. °C 40 Tolerance °C : **←** 2.0

Overflow valve : 2 417 413 082

Inlet press. bar : 3.0 Tolerance bar : ← 0.1

Test nozzle holde

: 1 688 901 105 assembly

Opening pressure

208.5 bar Tolerance bar : ← 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0 600 x length mm :

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

#### BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 10.00 Tolerance mm : +- 0.05 Tolerance mm Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50 Tolerance mm :  $\leftarrow$  0.50

Firing order : 6-2-4-1-5-: 3

Phasing : 0-60-120-180-240

: -30C

Tolerance : +- 0.50

Check

tolerance 'NW : +- 0.75

Start of delivery blocking

: **←** 0.50 Tolerance

Check

tolerance "NW :  $\leftarrow$  0.75

Barrel no. : 6

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR	<del> </del>
POSITION	Stanting position
	(M pump)  - Uact V : 4,500  - Tolerance Volt : +- 0,115  - CRT mm : 19,00  - Tolerance mm : +- 0,80
Engine speed min-1: 0	├ Uact V : 4,500
•	Tolerance Volt : +- 0,115
Setting point -	+ CRT mm : 19,00
(P, R and H pump) -	├ Tolerance mm : +- 0,80
•	+
Uact V : 3.100 -	+
CRT mm : 13.00 -	ENGINE-SPEED SENSOR
Tolerance mm : +/- 0.05	(All P and R pumps not
Check -	Hand M pumps)
tolerance mm : +/- 0.10 -	<u> </u>
-	Test with control rod
Check value -	in stop position
(P, R and H pump) -	Foreign around min 1. (0
•	Engine speed min-1: 60
- Wash W	Amplitude V : 1.4 Tolerance V : +/- 0.6
Uact V : 1.700 - CRT mm : 6.15 -	
CRT mm : 6.15 - Tolerance mm : +/- 0.25 -	Check 1 20
	tolerance V : +/- 1.20
Check -	Fingine speed min-(* 600
tolerance mm : +/- 0.30 -	Fingine speed min- <a href="final-to-600"></a>
-	
Setting point	Amplitude to Amplitude V : max.1.4
(M pump)	r Ampercode v . max. 1.4
(M. pulip)	
Uact V : 3.100	
Uact V : 3.100 - CRT mm : 12.50 -	(C) INJECTION PUMP WITH POSITIONER
Tolerance mm : +/- 0.05	L CONTINUE CONTINUE WITH TOST TONER
Check	TEST POINT V1
tolerance mm : +/- 0.10	7207 1 0211 71
-	- Rated speed rpm : 750
Check value	- Uact V : 3.350
(M. pump)	Prestroke solenoid
	Stroke mm : 10.00
Uact V : 1.700	- Del. quantity
CRT mm : 5.50	- cm3/1000 strokes : 332.0
Tolerance mm : +/- 0.25	Tolerance
Check	cm3/1000 strokes : + 1.0
tolerance mm : +/- 0.30	Check tolerance
-	- cm3/1000s. : +- 4.0
Stop position	FUEL DELIVERY CHARACTERISTICS
(P, R and H pump)	<b>-</b>
+	<del></del>
Uact V : Value with -	- Rated speed rpm : 1000
deenergised adjusting magnet -	- Uact V : 3.290
and control rod in	- Prestroke solenoid
stop position.	- Strokemm : 8.00
CRT mm : 0.75	- Del. quantity
Tolerance mm : +/- 0.25	- cm3/1000 strokes : 312.0
Check	- Tolerance
tolerance mm : +/- 0.35	- cm3/1000 strokes : +- 4.0
- <u>-</u>	- Check tolerance
Stop position	-  cm3/1000S. : +- 8.0
	(1107 10000)
(M pump)	-
Uact V : 0,720	<del>-</del>
	- Rated speed rpm : 500

Uact V	:		2.100	
Prestroke solenoi Stroke mm	<b>d</b> :		6.20	
Del. quantity cm3/1000 strokes	:		173.0	
Tolerance cm3/1000 strokes	:	+-	4.0	
Check tolerance cm3/1000s.	:	+-	8.0	
Rated speed rpm	:		<b>70</b> 0	
Prestroke solenoic Stroke mm	<b>3</b> :		10.00	
Del. quantity cm3/1000 strokes	:		70.0	
Tolerance				

Stroke mm	:		10.00
Del. quantity			
cm3/1000 strokes	:		70.0
Tolerance			
cm3/1000 strokes	:	+-	4.0
Check tolerance			
cm3/1000S.	:	+-	8.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000s.	:		9.0
TEAT DATHE IA			

Rated speed rpm Uact V	:		300 1,500
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.080
Prestroke solenoi	d		
Stroke mm	:		7.20
Del. quantity			
cm3/1000 strokes	:		<b>33</b> .0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spr <del>ee</del> d			
Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			
cm3/1000\$.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.450
Prestroke solenoi	d	
Stroke mm	:	7.00
Del. quantity		
cm3/1000 strokes	:	185.0
Tolerance		
cm3/1000 strokes	: +	- 10.0

Check	tolerance			
cm3/10	000\$.	;	+-	14.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition

: 15.10.98

Test oil

: ISO 4113

Combination No. : 0 402 796 827

Injection pump

Pump designation : PES6P120A720RS7356

EP type number : 0 412 726 919

Governor

Governer design. : RE30

Governer no. : 0 421 890 017

Cust. part No. : RE 501867

Customer-spec. information

Customer : DEERE

Motor

: 6081 HH004

Power KW

: 242.0

## TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

temp. °C

40

Tolerance °C

: **←** 2.0

Overflow valve : 2 417 413 077

Inlet press. bar :

2.0

Tolerance bar : + 0.1

Test nozzle holde assembly

: 1 688 901 103

Opening pressure

bar

Tolerance bar :  $\leftarrow$  1.5

208.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0

x length mm : 600

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 17.0 Tolerance bar : + 1.0

Prestroke mm : 3.60 Tolerance mm : + 0.05

Check

tolerance mm :  $\leftarrow$  0.10

Rack travel in mm : 10.50 Tolerance mm :  $\leftarrow$  0.50

: 1-5-3-6-2-Firing order

: 0-60-120-180-240 Phasing

: -300

Tolerance : **←** 0.50

Check

tolerance °NW : +- 0.75

Start of delivery blocking

\*NW after s.o.d. : 8.50 Tolerance : **←** 0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 VTESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) Uact V CRT mm 13.00 3.100 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10 Check value (P, R and H pump) CRT mm : 1.700 : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Setting point (M pump) : 3... 12.50 3.100 Uact V

CRT mm Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm

Check value (M pump)

: 1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ 

Stop position (P, R and H pump)

: Value with Uact V

deenergised adjusting magnet and control rod in

stop position.

CRT mm 0.75 : +/- 0.25 Tolerance mm

Check

tolerance mm : +/- 0.35

Stop position (dimud M)

Uact V 0,720 Tolerance Volt : +- 0,065 CRT mm : 1,00

Starting position (M pump)

Uact V 4,500 Tolerance Volt : ← 0,115 : 19,00 CRT mm Tolerance mm : +- 0,80

ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

(C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

Rated speed rpm : 1050 Uact V : 3.030 Del. quantity

cm3/1000 strokes : 213.0

Tolerance

cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance

cm3/1000S. : ← 4.0

Spreed Tolerance

cm3/1000 strokes : 5.0 Check tolerance

cm3/1000S. 9.0 FUEL DELIVERY CHARACTERISTICS

Rated speed rpm : 700 Uact V 3.120 Del. quantity

cm3/1000 strokes : 237.0

Tolerance cm3/1000 strokes	· +-	3.0
Check tolerance	•	3.0
cm3/1000S.	; +-	6.0
Spreed		
Tolerance		
cm3/1000 strokes	:	8.0
Check tolerance		
cm3/1000S.	:	12.0

Rated speed rpm	:		450
Uact V	:		1.740
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		26.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		6.0
Check tolerance			
cm3/1000S.	:		10.0

## STARTING FUEL DELIVERY

Uact V	:	100 4.550
Del. quantity cm3/1000 strokes	:	120.0
Tolerance cm3/1000 strokes Check tolerance	: ←	20.0
cm3/1000\$.	: +-	25.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil : 22.10.98 : ISO 4113

Combination No. : 0 402 696 805

Injection pump

Pump designation : PE6P120A320LS7922 EP type number : 0 412 626 975

Governor

Governer design. : RE30

Governer no. : 0 421 890 045

Cust. part No. : 9883189

Customer—spec. information

Motor

Customer : LIEBHERR
Motor : D9406TI-EA4

Power KW : 330.0

## TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

Tolerance °C : + 2.0

Overflow valve : 1 417 413 047

Inlet press. bar :

2.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

bar

: 208.5

Tolerance bar : +- 1.5

Test lines : 1 680 750 075

Outside diameter : 8.0

**8**SA

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : +- 1.0

Prestroke mm : 3.65Tolerance mm :  $\leftarrow 0.05$ 

Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50

Tolerance mm :  $\leftarrow$  0.50

Firing order : 1-6-3-5-2-

Phasing : 0-60-120-180-240

: -300

Tolerance : <del>←</del> 0.50

Check

tolerance 'NW : **←** 0.75

Start of delivery blocking

Tolerance : **←** 0.10

Check

tolerance °NW : **←** 0.75

Barrel no. : 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR
POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check
tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05
Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25
Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deenergised adjusting magnet and control rod in stop position.
CRT mm : 0.75 Tolerance mm : +/- 0.25 Check
tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : +- 0,065

CRT mm	: 1,00
Starting position	١
(M pump)	. 500
Uact V Tolerance Volt	: 4,500 : +- 0,115
CRT mm	: 19,00
Tolerance mm	: 19,00 : +- 0,80
	-,
ENGINE-SPEED SENS	SOR
(All P and R pump	
H and M pumps)	
Took with control	ned.
Test with control in stop position	. rod
·	
Engine speed min- Amplitude V	·1: 60
Amplitude V Tolerance V	: 1.4 : +/- 0.6
Check	. ,, 0.0
tolerance V	: +/- 1.20
Familia amand win	4. (00
Engine speed min- Difference	71: 000
Amplitude to	
Amplitude V	: max.1.4
(C) INJECTION PUM	P WITH POSITIONER
	P WITH POSITIONER
TEST POINT V1	
TEST POINT V1 Rated speed rpm	: 1050
TEST POINT V1 Rated speed rpm Uact V	
TEST POINT V1 Rated speed rpm Uact V Del. quantity	: 1050 : 3.000
TEST POINT V1 Rated speed rpm Uact V	: 1050 : 3.000
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 1050 : 3.000
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance	: 1050 : 3.000 : 295.0 : +- 1.0
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 1050 : 3.000 : 295.0
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	: 1050 : 3.000 : 295.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 1050 : 3.000 : 295.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Tolerance cm3/1000 strokes Tolerance cm3/1000 strokes Tolerance	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880 : 302.5 : +- 3.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 1050 : 3.000 : 295.0 : +- 1.0 : +- 4.0 : 5.0 : 9.0 RACTERISTICS : 800 : 2.880 : 302.5

Rated speed rpm	:		<b>55</b> 0
Uact V	:		2.190
Del. quantity			
cm3/1000 strokes	:		207.0
Tolerance			
cm3/1000 strokes	:	+	4.0
Check tolerance			
cm3/1000S.	:	+-	6.0

Rated speed rpm	:		350
Uact V	:		1.330
Tolerance Volt	;	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		15.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		8.0
Check tolerance			
cm3/1000s.	:		12.0

# STARTING FUEL DELIVERY

Rated speed rpm	:	100
Uact V	:	2.340
Del. quantity		
cm3/1000 strokes	:	150.0
Tolerance		
cm3/1000 strokes	: +-	10.0
Check tolerance		
cm3/1000S.	: +-	14.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 29.10.98 : ISO 4113

Combination No. : 0 402 196 717

Injection pump

Pump designation : PES6P120B720RS3409 EP type number : 0 412 026 812

Governor

Governer design. : RE30

Governer no. : 0 421 890 029

Cust. part No. : RE 502978

Customer-spec. information Customer : DEERE : 6081AT002 Motor

: 135.0

Power KW

## TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

temp. °C 40 Tolerance °C : +- 2.0

Overflow valve : 2 417 413 077

Inlet press. bar : 2.0Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly : 1 688 901 101

Opening pressure

Tolerance bar : +- 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

B03

x inside diameter : 3.0

x length mm :

## **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting.

Setting of constant delivery

under Section C.

### BEGINNING OF DELIVERY

Test pressure bar: 17.0 Tolerance bar : +- 1.0

Prestroke mm : 3.60 Tolerance mm : + 0.05 Check tolerance mm : +- 0.10

Rack travel in mm: 10.50 Tolerance mm : + 1.50

Firing order : 1-5-3-6-2-

: 0-60-120-180-240 Phasing

Start of delivery mark

°NW after s.o.d. : 7.00 : +- 0.50 Tolerance

Check

tolerance °NW : **←** 0.75

Barrel no.

: 1

Beginning of delivery differende

and maximum rack

travel : 15.00
Tolerance mm : + 0.50
Difference ° CS : 2.50

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION

Engine speed min-1:

Setting point (P, R and H pump)

Uact V 3.100 CRT mm 13.00 Tolerance mm : +/- 0.05

Check

: +/- 0.10 tolerance mm

Check value (P, R and H pump)

: 1.700 : 6.15 1.700 Uact V CRT mm Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30

Setting point (amua M)

Uact V 3.100 12.50 CRT mm : +/- 0.05 Tolerance mm Cneck

: +/- 0.10 tolerance mm

Check value (mpump)

1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25

Check

tolerance mm :  $\pm -0.30$ 

Stop position (P, R and H pump)

Uact V : Value with

> deenergised adjusting magnet and control rod in

> > stop position.

CRT mm 0.75 : +/- 0.25 Tolerance mm

Check

: +/- 0.35 tolerance mm

Stop position

(M pump)

Uact V 0,720 : +- 0,065 Tolerance Volt 1,00 CRT mm

Starting position

(dmuq M)

Uact V 4,500 Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : +- 0,80

ENGINE-SPEED SENSOR (All Pand R pumps not H and M pumps)

Test with control rod in stop position

Engine speed min-1: 1.4 Amplitude V : Tolerance V : +/- 0.6

Check

tolerance V : +/- 1.20

Engine speed min-1: 600

Difference Amplitude to

Amplitude V : max.1.4

## (C) INJECTION PUMP WITH POSITIONER

TEST POINT V1

Rated speed rpm : 1100 : 2.880 Uact V

Del. quantity

cm3/1000 strokes : 140.0

Tolerance

cm3/1000 strokes : +- 1.0

Check tolerance

cm3/1000s. 3.0

Spreed Tolerance

cm3/1000 strokes : 5.0

Check tolerance

cm3/1000S. 9.0

FUEL DELIVERY CHARACTERISTICS

700 Rated speed rpm : 2.880 Uact V

Del. quantity cm3/1000 strokes	: 141.5
Tolerance	
cm3/1000 strokes Check tolerance	: ← 3.0
cm3/1000S.	: +- 6.0
Spreed Tolerance	
cm3/1000 strokes	: 8.0
Check tolerance cm3/1000s.	: 12.0
Rated speed rpm	: 425
Uact V	: 1.610
Del. quantity cm3/1000 strokes	: 22.0
Tolerance	
cm3/1000 strokes Check tolerance	
cm3/1000s. Spreed	: +- 6.0
Tolerance	
cm3/1000 strokes Check tolerance	: 6.0
cm3/1000S.	: 10.0
TEST POINT L1	
Rated speed rpm	: 425
Uact V Tolerance Volt	: 1.610 : ← 0.060
Check tolerance	
Volt	: <del></del> 0.060
STARTING FUEL DEL	IVERY
Rated speed rpm	: 100
Uact V Del. quancity	: 4.600
cm3/1000 strokes	: 105.0
Tolerance cm3/1000 strokes	: <del></del> 10.0
Check tolerance	
cm3/1000S.	: ← 13.0

### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 29.10.98 Test oil : ISO 4113

Combination No. : 0 402 196 718

Injection pump

Pump designation : PES6P120B720RS3409

EP type number : 0 412 026 812

Governor

Governer design. : RE30

Governer no. : 0 421 890 029

Cust. part No. : RE 502979

Customer-spec. information Customer : DEERE : 6081HRW02 : 163.0 Motor Power KW

### TEST BENCH REQUIREMENTS

Inlet line : 4.2

Test oil inlet

: 40 temp. °C Tolerance °C : + 2.0

Overflow valve : 2 417 413 077

Inlet press. bar : inlet press. bar : 2.0 Tolerance bar : +- 0.1 2.0

Test nozzle holde

: 1 688 901 101 assembly

Opening pressure

: 208.5 bar Tolerance bar : ← 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

3.0

x inside diameter :

x length mm : 600

### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

### BEGINNING OF DELIVERY

17.0 Test pressure bar : Tolerance bar : + 1.0

Prestroke mm Tolerance mm 3.60 : **←** 0.05 Check

: +- 0.10 tolerance mm

Rack travel in mm : 10.50 Tolerance mm : +- 1.50

: 1-5-3-6-2-Firing order

: 4

Phasing : 0-60-120-180-240

: -300

Start of delivery blocking

\*Nw after s.o.d. : 7.75 Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

Beginning of delivery differende

and maximum rack

travel : 15.00
Tolerance mm : ← 0.50
Difference ° CS : 2.50

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 VTESTING & SETTING RACK TRAVEL SENSOR POSITION. Engine speed min-1: Setting point (P, R and H pump) Uact V 3.100 13.00 CRT mm Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm Check value (P, R and H pump) : 1.700 : 6.15 Uact V CRT mm Tolerance mm : +/- 0.25 Check : +/- 0.30 tolerance mm Setting point (m pump) Uact V 3.100 CRT mm 12.50 Tolerance mm : +/- 0.05 Check : +/- 0.10 tolerance mm Check value (amua M) : 1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Stop position (P, R and H pump)

: Value with

: +/- 0.25

deenergised adjusting magnet

0.75

stop position.

and control rod in

Check tolerance mm :  $\pm -0.35$ Stop position (M pump) Uact V 0,720 : +- 0,065 Tolerance Volt CRT mm 1,00 Starting position (dmuq M) Uact V 4,500 Tolerance Volt : + - 0,115CRT mm : 19,00 Tolerance mm : +- 0,80 ENGINE--SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: Amplitude V : Tolerance V : 1.4 : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 1100 Uact V 2.880 Del. quantity cm3/1000 strokes : 140.0 Tolerance cm3/1000 strokes : +-1.0 Check tolerance cm3/1000S. : +-4.0 Spreed Tolerance cm3/1000 strokes : 5.0 Check tolerance 9.0 cm3/1000s. FUEL DELIVERY CHARACTERISTICS

700

2.880

Rated speed rpm :

Uact V

Uact V

CRT mm

Tolerance mm

Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	
Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 8.0 : 12.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. TEST POINT L1 Rated speed rpm Uact V Tolerance Volt Check tolerance	: 1.610 : 22.0 : ← 3.0 : ← 6.0 : 6.0 : 10.0 : 425 : 1.610 : ← 0.060
STARTING FUEL DEL	: +- 0.060 
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition

: 05.11.98

Test oil

: ISO 4113

Combination No. : 0 401 496 001

Injection pump

Pump designation : PE6R120/720RS1502

EP type number : 0 411 426 002

Governor

Governer design. : RE31

Governer no. : 0 421 890 200

Cust. part No. : 1556156

: -P07 v. 12/95

Customer-spec. information

Customer : VOLVO-TRUCK

Motor

: TD 163 ES,EJ

Power KW

: 370.0

# TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

Tolerance °C

: <del>+-</del> 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 105

Opening pressure

208.5

Tolerance bar : +- 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter :

3.0

x length mm :

600

#### **REMARKS**

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

# BEGINNING OF DELIVERY

Test pressure bar : 31.0 Tolerance bar : +- 1.0

Prestroke mm : 5.40 Tolerance mm

: +- 0.05

Check

tolerance mm

: +- C.10

Rack travel in mm : 10.50

Tolerance mm : +- 0.50

Firing order

: 1-5-3-6-2-

Phasing

: 0-60-120-180-240

: -300

Tolerance Check

: +- 0.50

tolerance °NW

: <del>+-</del> 0.75

### Start of delivery mark

Tolerance

: +- 0.50

Check

tolerance °NW

: **←** 0.75

Barrel no.

: 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deenergised adjusting magnet and control rod in stop position.
CRT mm : 0.75 Tolerance mm : +/~ 0.25 Check
tolerance mm : +/~ 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065

CRT mm	: 1,00
Starting position (M pump) Uact V Tolerance Volt CRT mm Tolerance mm	: 4,500 : ← 0,115 : 19,00 : ← 0,80
ENGINE-SPEED SENS (All P and R pump H and M pumps)	
Test with control in stop position	rod
Engine speed min- Amplitude V Tolerance V Check tolerance V	: 1.4 : +/- 0.6 : +/- 1.20
Engine speed min- Difference Amplitude to Amplitude V	1: 600 : max.1.4
(C) INJECTION PUM	P WITH POSITIONER
(C) INJECTION PUM	P WITH POSITIONER
TEST POINT V1 Rated speed rpm	P WITH POSITIONER  : 550 : 2.950
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 550 : 2.950
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 550 : 2.950
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 550 : 2.950 : 395.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 550 : 2.950 : 395.0 : + 1.0 : + 4.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 550 : 2.950 : 395.0 : ← 1.0 : ← 4.0 : 6.0 : 10.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA	: 550 : 2.950 : 395.0 : +- 1.0 : +- 4.0 : 6.0 : 10.0 RACTERISTICS
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAI	: 550 : 2.950 : 395.0 : +- 1.0 : +- 4.0 : 6.0 : 10.0 RACTERISTICS 
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHAI	: 550 : 2.950 : 395.0 : +- 1.0 : +- 4.0 : 6.0 : 10.0 RACTERISTICS : 950 : 2.750 : 295.0

Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 9.0 : 13.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 950 : 2.000 : 163.0
Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: +- 3.0 : +- 6.0
TEST POINT L1	
Rated speed rpm Uact V Tolerance Volt	: 300 : 1.530 : +- 0.060
Check tolerance Volt Del. quantity	: ← 0.060
cm3/1000 strokes Tolerance	: 20.0
cm3/1000 strokes Spreed	: +- 3.0
Tolerance cm3/1000 strokes Check tolerance	: 7.0
cm3/1000s.	: 11.0

Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 401 496 003

Injection pump

Pump designation : PE6R120/720R\$1504 EP type number : 0 411 426 003

Governor

Governer design. : RE31

Governer no. : 0 421 890 200

Cust. part No. : 1556415

: -P10v20.11.96

Customer-spec. information

Customer : VOLVO-TRUCK

Motor : TD 164 Power KW : 382.0

TEST BENCH REQUIREMENTS

Inlet line : 3.2

Test oil inlet

temp. °C : 40
Tolerance °C : +- 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : ← 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter: 3.0 x length mm : 600

tength min . 000

**REMARKS** 

Pump-specific values in Section (B)

must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting. Setting of constant delivery

under Section C.

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BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar :  $\leftarrow$  1.0

Prestroke mm : 5.45 Tolerance mm : +- 0.05

Check

tolerance mm : +- 0.10

Rack travel in mm : 10.50Tolerance mm : + 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : +- 0.30

Check

tolerance °NW : +- 0.75

Start of delivery mark

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 VTESTING & SETTING RACK TRAVEL SENSOR POSITION Engine speed min-1: Setting point (P, R and H pump) Uact V CRT mm : 3.100 : 13.00 3.100 Tolerance mm :  $\pm -0.05$ Check tolerance mm :  $\pm -0.10$ Check value (P, R and H pump) : 1.700 : 6.15 CRT mm Tolerance mm : +/- 0.25 Check tolerance mm :  $\pm -0.30$ Setting point (amua M) : 3.100 : 12.50 Uact V CRT mm Tolerance mm :  $\pm -0.05$ Check : +/- 0.10 tolerance mm Check value (amuq M) : 1.700 Uact V CRT mm 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30 Stop position (P, R and H pump) Uact V : Value with deenergised adjusting magnet and control rod in stop position. 0.75 CRT mm : +/- 0.25 Tolerance mm Check

tolerance mm :  $\pm -0.35$ Stop position (M pump) Uact V 0,720 Tolerance Volt : + 0,065 CRT mm 1,00 Starting position (amua M) Uact V 4,500 Tolerance Volt : +- 0,115 : 19,00 CRT mm Tolerance mm : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/-0.6Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 525 Uact V 2.950 Del. quantity cm3/1000 strokes : 390.0 Tolerance cm3/1000 strokes : +- 1.0 Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes : 6.0 Check tolerance cm3/1000s. 10.0 FUEL DELIVERY CHARACTERISTICS 900 Rated speed rpm Uact V 3.240 Del. quantity cm3/1000 strokes : 386.0

Tolerance	
cm3/1000 strokes Check tolerance	: ← 3.0
cm3/1000\$.	: ← 6.0
Tolerance cm3/1000 strokes	: 9.0
Check tolerance cm3/1000s.	: 13.0
Rated speed rpm	: 900 : 2.000
Uact V Del. quantity	: 2.000
cm3/1000 strokes Tolerance	: 163.0
cm3/1000 strokes Check tolerance	: <b>←</b> 3.0
cm3/1000s.	: <del></del> 6.0
TEST POINT L1	
Rated speed rpm	: 265
Rated speed rpm Uact V	: 265 : 1.630
Uact V	: 1.630
Tolerance Volt	: +- 0.060
Check tolerance	0.040
Volt Del. quantity	: +- 0.060
cm3/1000 strokes	: 19.0
Del. quantity cm3/1000 strokes	: 20.0
Tolerance cm3/1000 strokes	: ← 3.0
Tolerance cm3/1000 strokes	: <b>←</b> 3.0
Spreed Tolerance	
cm3/1000 strokes	: 7.0
Tolerance cm3/1000 strokes	: 7.0
Check tolerance	. 7.0
cm3/1000s.	: 11.0
Check tolerance	44.6
cm3/1000s.	: 11.0

#### Note remarks

Refer to Service Info for test and adjustment instructions.
See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 401 496 004

Injection pump

Pump designation : PE6R120/720RS1512 EP type number : 0 411 426 005

Governor

Governer design. : RE31

Governer no. : 0 421 890 202

Cust. part No. : 1556958

: <del>-P</del>02 v. 03/98

Customer—spec. information

Customer : VOLVO-TRUCK

Motor : TD 164 Power KW : 382.0

# TEST BENCH REQUIREMENTS

Inlet line : 3.2

Test oil inlet

temp. °C : 40
Tolerance °C : + 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5 Tolerance bar : + 0.1

Test nozzle holde

assembly : 1 688 901 105

Opening pressure

bar : 208.5 Tolerance bar : + 1.5

Test lines : 1 680 750 089

Outside diameter : 8.0

x inside diameter : 3.0
x length mm : 600

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 26.0 Tolerance bar : + 1.0

Prestroke mm : 5.45
Tolerance mm : +- 0.05

Check

tolerance mm :  $\leftarrow$  0.10

Rack travel in mm : 10.50 Tolerance mm : +- 0.50

Firing order : 1-5-3-6-2-

. 4

Phasing : 0-60-120-180-240

: -300

Tolerance :  $\leftarrow$  0.50

Check

tolerance  $^{\circ}NW$  :  $\leftarrow$  0.75

Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1	+ CRT mm : 0.75 + Tolerance mm : +/- 0.25 + Check + tolerance mm : +/- 0.35
(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V	Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065 CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION	Starting position
Engine speed min-1: 0	(M pump)  + Uact V : 4,500  + Tolerance Volt : +- 0,115
Setting point (P, R and H pump)	+ CRT mm : 19,00 + Tolerance mm : + 0,80
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10	ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps)  Test with control rod
Check value (P, R and H pump)	in stop position Engine speed min-1: 60
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check	Amplitude V : 1.4 Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20
tolerance mm : +/- 0.30	Engine speed min-1: 600 Difference Amplitude to
Setting point (M pump)	Amplitude V : max.1.4
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/~ 0.05 Check	(C) INJECTION PUMP WITH POSITIONER TEST POINT V1
tolerance mm : +/- 0.10	Rated speed rpm : 525
Check value (M pump)	Uact V : 2.950 Del. quantity cm3/1000 strokes : 390.0
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25	Tolerance + cm3/1000 strokes : +- 1.0 + Check tolerance
Check tolerance mm : +/- 0.30	+ cm3/1000S. : + 4.0 + Spreed + Tolerance
Stop position (P, R and H pump)	cm3/1000 strokes : 6.0 Check tolerance
Uact V : Value with deenergised adjusting magnet	+ cm3/1000s. : 10.0 + FUEL DELIVERY CHARACTERISTICS
and control rod in stop position.	Rated speed rpm : 900

Uact V	: 3.240
Del. quantity cm3/1000 strokes	: 385.0
Tolerance cm3/1000 strokes	: <b>←</b> 3.0
Check tolerance	
cm3/1000s. Spreed	: <del>+-</del> 6.0
Tolerance cm3/1000 strokes	: 9.0
Check tolerance	
cm3/1000s.	: 13.0
Rated speed rpm	: 900
Uact V Del. quantity	: 2.000
cm3/1000 strokes	: 159.0
Tolerance cm3/1000 strokes	: +- 3.0
Check tolerance cm3/1000s.	: +- 6.0
TEST POINT L1	
	. 245
Rated speed rpm Rated speed rpm	: 265 : 265
Uact V	: 1.630
Uact V	: 1.630
Tolerance Volt	: +- 0.060
Check tolerance	. 0.040
Volt	: <b>+-</b> 0.060
Del. quantity cm3/1000 strokes	: 19.0
Del. quantity	. 17.0
cm3/1000 strokes	: 20.0
Tolerance	
cm3/1000 strokes	: ← 3.0
Tolerance cm3/1000 strokes	: +- 3.0
Spreed	. 1 3.0
Tolerance	
cm3/1000 strokes	: 7.0
Tolerance	
cm3/1000 strokes	: 7.0
Check tolerance	. 44 0
cm3/1000S. Check tolerance	: 11.0
cm3/1000s.	: 11.0
····· / 10000 ·	. 11.0

Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 05.11.98 : ISO 4113

Combination No. : 0 402 896 009

Injection pump

Pump designation : PE6P120A320RS8020 EP type number : 0 412 826 021

Governor

Governer design. : RE30

Governer no. : 0 421 890 010

Cust. part No. : 479889-P03 V.08/95

Customer-spec. information

Customer : VOLVO-TRUCK

: TD123,TD103 E ES Motor

Power KW : 290.0

TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C 40

Tolerance °C : **←** 2.0

Overflow valve : 2 417 413 098

Inlet press. bar : 2.5

Tolerance bar : + 0.1

Test nozzle holde

: 1 688 901 103 assembly

Opening pressure

208.5 bar Tolerance bar : +- 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar : Tolerance bar : + 1.0

Prestroke mm : 4.05 Tolerance mm : +- 0.05

Check

tolerance mm : + 0.10

Rack travel in mm : 10.50

Tolerance mm :  $\leftarrow$  0.50

Firing order : 1-5-3-6-2-

: 4

Phasing : 0-60-120-180-240

: -300

Tolerance : +- 0.50

Check

: +- 0.75 tolerance °NW

Start of delivery mark

Barrel no. : 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR

POSITION

Engine speed min-1:

B18

Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deemergised adjusting magnet and control rod in stop position.
CRT mm : 0.75 Tolerance mm : +/- 0.25
Check tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : + 0,065 CRT mm : 1,00
Starting position (M pump) Uact V : 4,500

Tolerance Volt : +- 0,115 CRT mm : 19,00 Tolerance mm : +- 0,80 ENGINE-SPEED SENSOR (All P and R pumps not H and M pumps) Test with control rod in stop position Engine speed min-1: 60
Amplitude V : 1.4
Tolerance V : +/- 0.6 Check tolerance V : +/- 1.20 Engine speed min-1: 600 Difference Amplitude to Amplitude V : max.1.4 (C) INJECTION PUMP WITH POSITIONER TEST POINT V1 Rated speed rpm : 600 Del. quantity cm3/1000 strokes : 302.0 Tolerance cm3/1000 strokes :  $\leftarrow$  1.0 Check tolerance cm3/1000s. : +- 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s. 11.0 FUEL DELIVERY CHARACTERISTICS Rated speed rpm : 950 Uact V 2.800 Del. quantity cm3/1000 strokes : 258.0

Rated speed rpm : 950
Uact V : 2.800
Del. quantity
cm3/1000 strokes : 258.0
Tolerance
cm3/1000 strokes : + 3.0
Check tolerance
cm3/1000s. : + 6.0
Spreed
Tolerance
cm3/1000 strokes : 10.0
Check tolerance
cm3/1000 strokes : 10.0
Check tolerance
cm3/1000s. : 14.0

Rated speed rpm Uact V	:	950 2.200
Del. quantity cm3/1000 strokes	:	183.0
Tolerance cm3/1000 strokes Check tolerance	; +-	- 3.0
cm3/1000s.	; +-	6.0
TEST POINT L1		

Rated speed rpm	:		250
Uact V	:		1.400
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		22.0
Tolerance			
cm3/1000 strokes	:	+-	2.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000s.	:		8.0
	•		

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition : 05.11.98 Test oil : ISO 4113

Combination No. : 0 402 896 015

Injection pump

Pump designation : PE6P120A320R\$8033

EP type number : 0 412 826 031

Governor

Governer design. : RE30

Governer no. : 0 421 890 027

Cust. part No. : 425758 PO5 v. 11/95

Customer-spec. information

Customer : VOLVO—TRUCK
Motor : DH 10 A

Motor

: DH 10 A : 265.0

Power KW

#### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C : 40 Tolerance °C :  $\leftarrow$  2.0

Overflow valve : 2 417 413 097

Inlet press. bar : 3.0 Tolerance bar : + 0.1 Inlet press. bar :

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

B21

x inside diameter: 2.0 x length mm :

600

## REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS No basic setting. Setting of constant delivery under Section C.

#### BEGINNING OF DELIVERY

Test pressure bar : Tolerance bar : + 0.2

Prestroke mm

Toterance mm

: +- 0.05

Check

tolerance mm

: +<del>-</del> 0.10

Rack travel in mm : 10.50Tolerance mm :  $\leftarrow 0.50$ 

Firing order : 1-5-3-6-2-

Phasing

: 0-60-120-180-240

. -300

Tolerance

: **←** 0.50

Check

tolerance °NW : + 0.75

# Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : ← 0.75

Barrel no.

: 1

(B) POSITIONER TESTING

Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1:
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check
tolerance mm : +/- 0.30  Stop position (P, R and H pump)
Uact V : Value with deenergised adjusting magnet and control rod in
stop position.  CRT mm : 0.75  Tolerance mm : +/- 0.25  Check tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : +- 0,065

CRT mm	: 1,00
Starting position (M pump) Uact V Tolerance Volt CRT mm Tolerance mm	: 4,500 : +- 0,115 : 19,00 : +- 0,80
ENGINE-SPEED SENS (All P and R pump H and M pumps)	
Test with control in stop position	. rod
	: 1.4 : +/- 0.6 : +/- 1.20
Engine speed min- Difference Amplitude to Amplitude V	-1: 600 : max.1.4
(C) INJECTION PUN	IP WITH POSITIONER
(C) INJECTION PUM TEST POINT V1	IP WITH POSITIONER
TEST POINT V1 Rated speed rpm Uact V	
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 600 : 2.800
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes	: 600 : 2.800
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	: 600 : 2.800 : 295.0
TEST POINT V1 Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s.	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHA	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0 RACTERISTICS
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000S. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000S. FUEL DELIVERY CHA	: 600 : 2.800 : 295.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance	: 600 : 2.800 : 295.0 : + 1.0 : + 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800 : 252.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000 strokes Check tolerance cm3/1000s. FUEL DELIVERY CHA  Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 600 : 2.800 : 295.0 : + 1.0 : + 4.0 : 8.0 : 11.0 RACTERISTICS : 950 : 2.800 : 252.0

Tolerance cm3/1000 strokes	:	10.0
Check tolerance cm3/1000s.	:	14.0

Rated speed rpm Uact V	:	950 2.200
Del. quantity cm3/1000 strokes Tolerance	:	178.0
cm3/1000 strokes Check tolerance	: +-	- 3.0
cm3/1000\$.	: +-	6.0

# TEST POINT L1

Rated speed rpm	:	250
Uact V	:	1.470
Tolerance Volt	: •	<b></b> 0.060
Check tolerance		
Volt	: •	<b>-</b> 0.060
Del. quantity		
cm3/1000 strokes	:	21.0
Tolerance		
cm3/1000 strokes	: •	<b>⊢</b> 3.0
Spreed		
Tolerance		
cm3/1000 strokes	:	5.0
Check tolerance		
cm3/1000S.	:	8.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 05.11.98 : ISO 4113

Combination No. : 0 402 896 016

Injection pump

Pump designation : PE6P120A320RS8034

EP type number : 0 412 826 032

Governor

Governer design. : RE30

Governer no. : 0 421 890 028

Cust. part No. : 8194088 P06 v.02.98

Customer-spec. information

Customer : VOLVO-TRUCK

Motor

: D 10, DH 10

Power KW

: 265.0

TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

40

Tolerance  $^{\circ}C$  : +- 2.0

Overflow valve : 2 417 413 097

Inlet press. bar : 3.0

Tolerance bar : + 0.1

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : +- 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

x inside diameter : 2.0 x length mm : 600

REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

BEGINNING OF DELIVERY

Test pressure bar :

Tolerance bar : +- 0.2

Prestroke mm : 4.40 Tolerance mm : + 0.05

Check

tolerance mm : +- 0.10

Rack travel in mm : 8.50

Tolerance mm

: **←** 0.50

Firing order : 1-5-3-6-2-

: 4

Phasing

: 0-60-120-180-240

: -300

Tolerance Check

: +- 0.50

tolerance °NW : +- 0.75

Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

TESTING & SETTING RACK TRAVEL SENSOR POSITION
Engine speed min-1: 0
Setting point (P, R and H pump)
Uact V : 3.100 CRT mm : 13.00 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (P, R and H pump)
Uact V : 1.700 CRT mm : 6.15 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Setting point (M pump)
Uact V : 3.100 CRT mm : 12.50 Tolerance mm : +/- 0.05 Check tolerance mm : +/- 0.10
Check value (M pump)
Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30
Stop position (P, R and H pump)
Uact V: Value with deenergised adjusting magnet and control rod in stop position.
CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35
Stop position (M pump) Uact V : 0,720 Tolerance Volt : +- 0,065

CRT mm	: 1,00
Starting position (M pump) Uact V Tolerance Volt CRT mm Tolerance mm	: 4,500
ENGINE-SPEED SENS (All P and R pump H and M pumps)	
Test with control in stop position	l rod
Engine speed min- Amplitude V Tolerance V Check tolerance V	-1: 60 : 1.4 : +/- 0.6 : +/- 1.20
Engine speed min- Difference Amplitude to Amplitude V	-1: 600 : max.1.4
(0)	
(C) INJECTION PUN	MP WITH POSITIONER
(C) INJECTION PUN	1P WITH POSITIONER
TEST POINT V1  Rated speed rpm Uact V Del. quantity	: 600 : 2.800
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance	: 600 : 2.800 : 303.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 600 : 2.800
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed	: 600 : 2.800 : 303.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes	: 600 : 2.800 : 303.0 : +- 1.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance	: 600 : 2.800 : 303.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0
TEST POINT V1  Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000s. FUEL DELIVERY CHA	: 600 : 2.800 : 303.0 : ← 1.0 : ← 4.0 : 8.0 : 11.0
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000s. FUEL DELIVERY CHA Rated speed rpm Uact V Del. quantity cm3/1000 strokes	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 :RACTERISTICS : 950 : 2.800
Rated speed rpm Uact V Del. quantity cm3/1000 strokes Tolerance cm3/1000s. Spreed Tolerance cm3/1000 strokes Check tolerance cm3/1000s. Spreed Tolerance cm3/1000s. FUEL DELIVERY CHA	: 600 : 2.800 : 303.0 : +- 1.0 : +- 4.0 : 8.0 : 11.0 :RACTERISTICS : 950 : 2.800

heck tolerance m3/1000s. : 14.0
ated speed rpm : 950 act V : 2.200 el. quantity
m3/1000 strokes : 184.0 olerance
m3/1000 strokes : +- 3.0 heck tolerance
m3/1000s. : ← 6.0
EST POINT L1
ated speed rpm : 250 act V : 1.470 olerance Volt : + 0.060
heck tolerance olt : +- 0.060 el. quantity
m3/1000 strokes : 22.0 olerance
m3/1000 strokes : +- 3.0 preed
olerance m3/1000 strokes : 5.0
heck tolerance m3/1000s. : 8.0

#### Note remarks

Refer to Service Info for test and adjustment instructions. See microcard(s) W400/...

Edition Test oil

: 05.11.98 : ISO 4113

Combination No. : 0 402 896 020

Injection pump

Pump designation : PE6P12OA32ORS8057 EP type number : 0 412 826 041

Governor

Governer design. : RE30

Governer no. : 0 421 890 028

Cust. part No. : 8194566 PO1 v.02.98

Customer-spec. information

Customer : VOLVO-TRUCK

Motor Power KW

: D 10 : 265.0

#### TEST BENCH REQUIREMENTS

Inlet line : 3.1

Test oil inlet

temp. °C

40

Tolerance °C

: +- 2.0

Overflow valve : 2 417 413 097

Inlet press. bar : 3.0Tolerance bar :  $\leftarrow$  0.1

Test nozzle holde

assembly

: 1 688 901 103

Opening pressure

bar

208.5

Tolerance bar : + 1.5

Test lines : 1 680 750 008

Outside diameter : 6.0

**B27** 

x inside diameter: 2.0

x Length mm :

600

#### REMARKS

Pump-specific values in Section (B) must be observed!

(A) INJECTION PUMP SETTINGS

No basic setting.

Setting of constant delivery

under Section C.

## BEGINNING OF DELIVERY

Test pressure bar : 3.0 Tolerance bar : ← 0.2

Prestroke mm : 4.40 Tolerance mm : ← 0.05

Check

tolerance mm : +- 0.10

Rack travel in mm : 8.50

Tolerance mm : +- 0.50

Firing order : 1-5-3-6-2-

: 0-60-120-180-240 Phasing

: -300

: +- 0.50 Tolerance

Check

tolerance °NW : +- 0.75

Start of delivery mark

Tolerance :  $\leftarrow$  0.50

Check

tolerance °NW : +- 0.75

Barrel no. : 1

(B) POSITIONER TESTING Warm-up time: 3 minutes at n=600 min-1, Uact = 2.5 V

	+ CRT mm : 1,00
TESTING & SETTING RACK TRAVEL SENSOR POSITION	Stanting position
Engine speed min-1: 0	Starting position
Catting paint	tolerance volt : + U,115
Setting point (P, R and H pump)	Tolerance mm : +- 0,80
Uact V : 3.100 CRT mm : 13.00	Ţ
CRT mm : 13.00 Tolerance mm : +/- 0.05	+ ENGINE-SPEED SENSOR
	+ (All P and R pumps not
Check tolerance mm : +/- 0.10	H and M pumps)
toterance min . 47 = 0.10	Test with control rod
Check value (P, R and H pump)	in stop position
•	+ Engine speed min-1: 60
4.700	Engine speed min-1: 60 Amplitude V : 1.4 Tolerance V : +/- 0.6
Uact V : 1.700 CRT mm : 6.15	+ Tolerance V : +/- U.6 + Check
Tolerance mm : +/- 0.25	tolerance V : +/- 1.20
Check	+
tolerance mm : +/- 0.30	Engine speed min-1: 600 Difference
	+ Amplitude to
Setting point (M pump)	Amplitude V . max.1.4
Uact V : 3.100 CRT mm : 12.50	I
CPT mm · 12 50	(C) INJECTION PUMP WITH POSITIONER
CK1 (M)	T (C) THRECITON COLL MILL COTTIONER
CRT mm : 12.50 Tolerance mm : +/- 0.05	+
Check	TEST POINT V1
Toterance mm : +/- U.US	TEST POINT V1
Check	+
Check tolerance mm : +/- 0.10	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity
Check tolerance mm : +/- 0.10  Check value (M pump)	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700  CRT mm : 5.50	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700  CRT mm : 5.50  Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700  CRT mm : 5.50	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700  CRT mm : 5.50  Tolerance mm : +/- 0.25  Check tolerance mm : +/- 0.30	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed  Tolerance
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed  Tolerance  cm3/1000 strokes : 8.0
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700  CRT mm : 5.50  Tolerance mm : +/- 0.25  Check tolerance mm : +/- 0.30	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity  cm3/1000 strokes : 303.0  Tolerance  cm3/1000 strokes : + 1.0  Check tolerance  cm3/1000s : + 4.0  Spreed  Tolerance  cm3/1000 strokes : 8.0  Check tolerance  cm3/1000 strokes : 11.0
Check tolerance mm : +/- 0.00  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0  Spreed  Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check	TEST POINT V1  Rated speed rpm : 600 Uact V : 2.800 Del. quantity cm3/1000 strokes : 303.0 Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000S : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000 strokes : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position	Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : 4.0 Check tolerance
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position (M pump)	TEST POINT V1  Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0  Check tolerance cm3/1000s : + 4.0  Spreed  Tolerance cm3/1000 strokes : 8.0  Check tolerance cm3/1000s : 11.0  FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950  Uact V : 2.800  Del. quantity cm3/1000 strokes : 261.0  Tolerance cm3/1000 strokes : + 3.0  Check tolerance cm3/1000s : + 6.0
Check tolerance mm : +/- 0.10  Check value (M pump)  Uact V : 1.700 CRT mm : 5.50 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.30  Stop position (P, R and H pump)  Uact V : Value with deenergised adjusting magnet and control rod in stop position.  CRT mm : 0.75 Tolerance mm : +/- 0.25 Check tolerance mm : +/- 0.35  Stop position	Rated speed rpm : 600  Uact V : 2.800  Del. quantity cm3/1000 strokes : 303.0  Tolerance cm3/1000 strokes : + 1.0 Check tolerance cm3/1000s : + 4.0 Spreed Tolerance cm3/1000 strokes : 8.0 Check tolerance cm3/1000s : 11.0 FUEL DELIVERY CHARACTERISTICS  Rated speed rpm : 950 Uact V : 2.800 Del. quantity cm3/1000 strokes : 261.0 Tolerance cm3/1000 strokes : 4.0 Check tolerance

Tolerance cm3/1000 strokes	;	10.0
Check tolerance cm3/1000S.	:	14.0

Rated speed rpm Uact V	:	_	950 2.200
Del. quantity cm3/1000 strokes Tolerance	:		184.0
cm3/1000 strokes Check tolerance	;	+-	3.0
cm3/1000s.	:	+-	6.0

# TEST POINT L1

Rated speed rpm	:		250
Uact V	:		1.470
Tolerance Volt	:	+-	0.060
Check tolerance			
Volt	:	+-	0.060
Del. quantity			
cm3/1000 strokes	:		22.0
Tolerance			
cm3/1000 strokes	:	+-	3.0
Spreed			
Tolerance			
cm3/1000 strokes	:		5.0
Check tolerance			
cm3/1000\$.	:		8.0